

Exploring the Relationship between Innovation and the Intensity of ICT Use by Businesses

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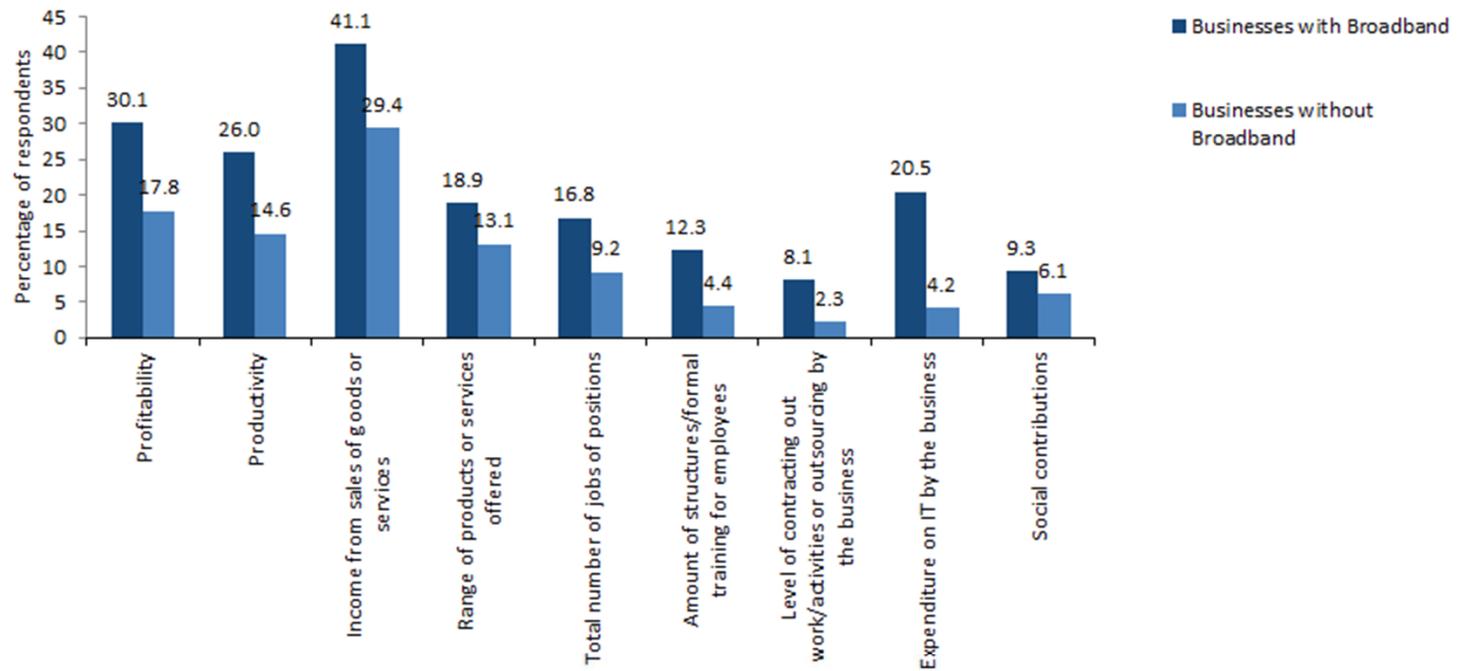
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Australian Bureau of Statistics

Selected business internet activities, by innovation status, 2009–10

	Innovating businesses	Non- innovating businesses
	%	%
Selected activities		
Financial (including online banking, invoicing, making payments)	89.5	80.6
Enabling persons working for the business to:		
work from home	42.3	24.0
work from other locations	35.5	15.2
Information gathering or researching for:		
assessing or modifying this business's range of products, services, processes or methods.	52.5	27.2
development of new or improved products, services, processes or methods.	35.1	12.7
monitoring competitors	36.3	15.8
identifying future market trends	28.3	11.7
Online training/learning	33.6	14.7
Information sharing or data exchange (eg. EDI, FTP) with:		
customers or clients	24.6	11.7
other business organisations	18.2	7.0
Source: ABS Business Characteristics Survey 2009-10		

Increases in business performance from the previous year, by broadband status, 2009-10



Source: ABS (2011) *Selected Characteristics of Australian Business, 2009-10*, cat. no. 8167.0

ICT is an enabler of innovation

Innovation is a driver of productivity

Research objectives

- Examine the relationship between business ICT usage and innovation activities
- Question: Do firms which use ICT more intensely have a higher probability of undertaking innovative activity?
 - What types of innovation does it enable?
 - Are intense ICT users likely to have more novel innovations?

Defining innovation

- Innovation (Oslo Manual)
 - Four types: product, process, organisational and marketing
 - Innovation statuses: introduced or implemented, still in development, abandoned
- Focus of this study
 - ‘Innovation-active’- irrespective of the status

Scope of ICT

- ICT includes computer use, IT support and security, Internet use, Web presence and website features, e-commerce (placing and receiving orders via the Internet, automated links of e-commerce to other business systems).
- Summary indicator used- 'ICT intensity index'

Data

- ABS Business Characteristics Survey
 - 2005-06 and 2006-07
- Use of ICT and Innovation details asked in alternating years
 - 2005-06- Use of ICT
 - 2006-07- Innovation
- Business Characteristics Survey data when combined with financial data form the Business Longitudinal Database

Data (continued)

- 6,442 businesses appearing in both 2005-06 and 2006-07 surveys (overlap)
- SMEs and large firms in scope
- BCS collects info on business demographics, market and competition, innovation and use of ICT
- Added to this are financial data sourced from taxation records

Methodology/results

- Cross-tabulation and correlation analysis
 - Positive correlation between ICT and innovation variables
 - Innovation also positively correlated with firm size, export activity, foreign ownership and market share

Methodology/results

- Regression analysis
 - Binary probit- ‘propensity to innovate’
 - Ordered probit- Innovation novelty and multiple types of innovation
- ICT included as explanatory variable
- But needed a summary ICT indicator – hence the ‘ICT intensity index’

'ICT intensity'

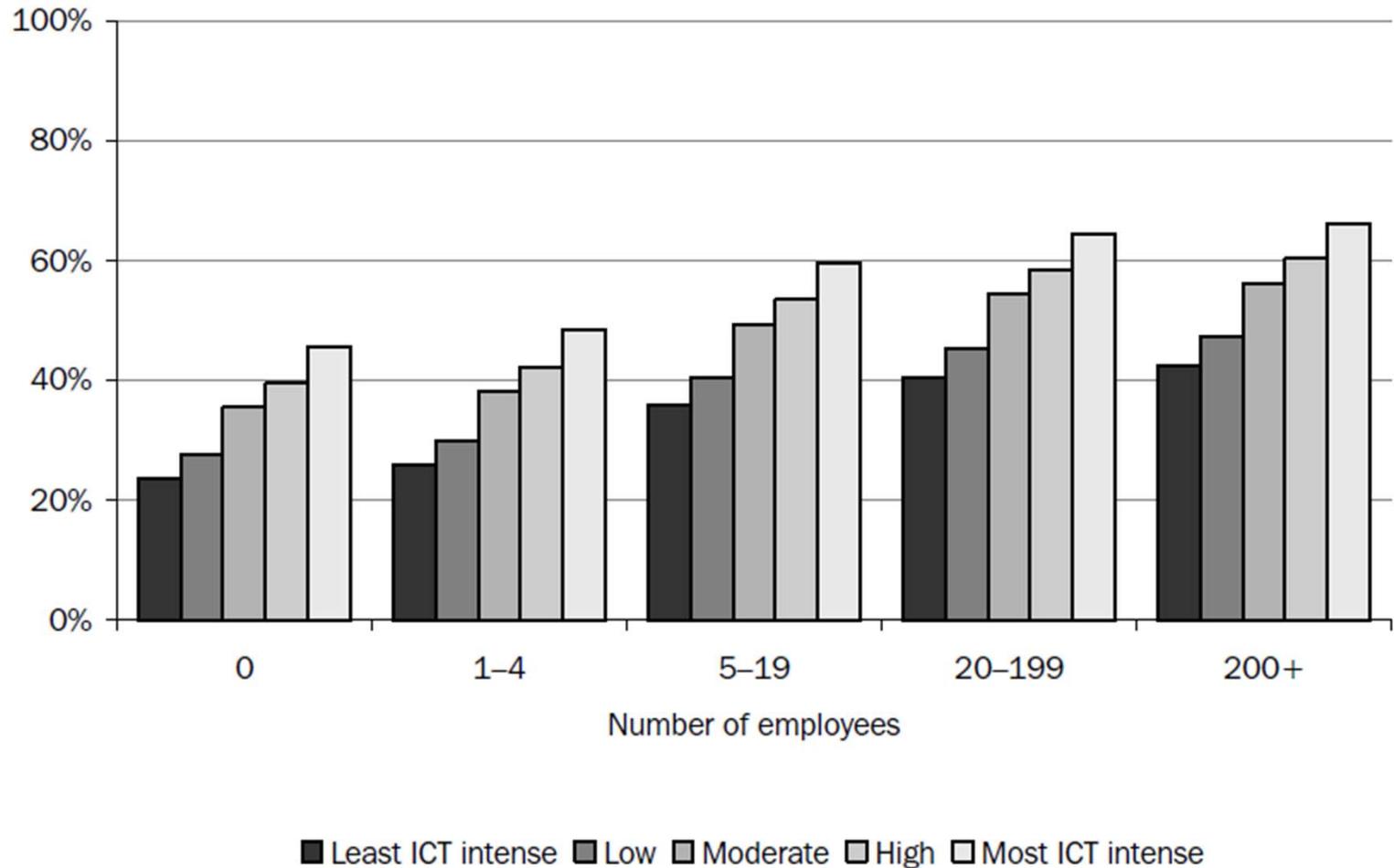
Value	Description	% of firms
1 = Highest Intensity	Broadband Internet, Web Presence, Receives orders via the Internet <i>and</i> reports using IT to a 'high' extent in at least five business activities	11%
2 = High	Broadband Internet, Web Presence and Receives orders via the Internet , but reports using IT to a 'high' extent in less than five business activities	9%
3 = Moderate	Broadband Internet and Web Presence , but does not Receive orders via the Internet	32%
4 = Low	Broadband Internet, but no Web Presence	22%
5 = Basic Intensity	No Broadband Internet	27%

ICT intensity and innovation

ICT Intensity	% Non-innovators	% Innovators
1 = Highest Intensity	29.5%	70.5%
2 = High	40.1%	59.9%
3 = Moderate	41.3%	58.7%
4 = Low	62.2%	37.8%
5 = Basic Intensity	70.3%	29.7%
Total	52.4%	47.7%

Polychoric Correlation Coefficient = -0.37

Estimated probability of engaging in innovative activity



Conclusions

- ICT intensity index is a useful way of combining/categorising the sophistication of IT use by businesses
- CAUTION
 - The introduction of sophisticated ICT use could itself be an innovation
 - BCS questionnaire prevents us from knowing exactly what the innovation was

Conclusions (cont...)

- Businesses using ICT more intensely are more likely to undertake innovation
- They are also more likely to undertake multiple types of innovation, more novel innovations and develop the innovations internally
- Beware of implying causality

Where to from here?

- Repeat the analysis to include all 6 years of data from the BCS (over 6,000 firms common across all time periods)
- Extend the work to include productivity and profitability indicators and see what we get!

Answering questions related to session focus

- Australia has the data – integrated longitudinal dataset
- Analytical work is patchy
- There are some gaps
- Use of regulatory (administrative) data is critical to the ABS' strategy to improve quality and range of statistics

Thank you